Proposal Reviews

#247: Organic Matter Composition of Sediments in the Sacramento-San Joaquin River Delta: Past and Present Sources of Organic Carbon and Implications for Ecosystem Restoration

Virginia Institute of Marine Science

Initial Selection Panel Review	
Research and Restoration Technical Panel Review	
Bay Regional Review	
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Prior Performance/Next Phase Funding	
Environmental Compliance	
Budget	

Initial Selection Panel Review:

CALFED Bay-Delta 2002 ERP PSP
Initial Selection Panel Review

Proposal Number: 247

Applicant Organization: Virginia Institute of Marine Science

Proposal Title: Organic Matter Composition of Sediments in the Sacramento-San Joaquin River Delta: Past and Present Sources of Organic Carbon and Implications for Ecosystem Restoration

Please provide an overall evaluation rating.

Explanation of Recommendation Categories: Fund

- **As Is** (a proposal recommended for funding as proposed)
- **In Part** (a proposal for which partial funding is recommended for selected project phases or components)
- **With Conditions** (a proposal for which funds are recommended if the applicant contractually agrees to meet the specified conditions)

Consider as Directed Action in Annual Workplan (a proposal addressing a high priority action that requires some revision followed by additional review prior to being recommended for funding)
Not Recommended (a proposal not currently recommended for funding-after revision may be considered in the future)

Note on "Amount":

For proposals recommended as Fund As Is, Fund In Part or Fund With Conditions, the dollar amount is the amount recommended by the Selection Panel.

For proposals recommended as Consider as Directed Action in Annual Workplan, the dollar amount is the amount requested by the applicant(s).

Fund	
As Is	**-**
In Part	**-**
With Conditions	**-**
Consider as Directed Action	**-**
Not Recommended	**X**

Amount: **$0**

Conditions, if any, of approval (if there are no conditions, please put "None"):

None

Provide a brief explanation of your rating:

The proposed project aims to improve understanding of carbon cycling in the Delta, and to provide historical perspective on how the Delta ecosystem has changed over time with respect to carbon. However, the Selection Panel determined that this proposal should not be funded largely because the significance of the work is not clear. There is no established link to the ERP or existing in-Delta restoration efforts, nor is it clear how any information gained would be useful in implementing adaptive management efforts or in management decisions.

Research and Restoration Technical Panel Review:

CALFED Bay-Delta 2002 ERP PSP
Research and Restoration Technical Panel Review Form

Proposal Number: 247

Applicant Organization: Virginia Institute of Marine Science

Proposal Title: Organic Matter Composition of Sediments in the Sacramento-San Joaquin River Delta: Past and Present Sources of Organic Carbon and Implications for Ecosystem Restoration

Review:

Please provide an overall evaluation summary rating:

Superior: outstanding in all respects;
Above Average: Quality proposal, medium or high regional value, and no significant administrative concerns;
Adequate: No serious deficiencies, no significant regional impediments, and no significant administrative concerns;
Not Recommended: Serious deficiencies, significant regional impediments or significant administrative concerns.

Overall Evaluation Summary Rating	**Provide a brief explanation of your summary rating**
-Superior	**The project will provide information on sources of organic matter in Delta sediments. It will contribute to basic knowledge and provide an historical perspective of change in this ecosystem, but it is less applicable to guiding restoration efforts or for characterizing organic matter sources that support Delta food webs. The proposed research is poorly integrated with on-going research in the Delta.**
-Above average	
XAdequate	
-Not recommended	

1. **Goals and Justification.** Does the proposal present a clear statement of goals, objectives and hypotheses? Does the proposal present a clear justification and conceptual model for the project?

   Goals and objectives are clearly stated and based on a conceptual model of organic matter sources in Delta sediments. The project is justified in that human activities have altered organic matter delivery.

2. **Likelihood of Success (Approach, Feasibility, Capabilities and Performance Measures).** Is the project likely to succeed based on the approach, feasibility and project team capabilities? Are the proposed performance measures adequate for measuring the project's success?

   It is clear that the project will extend our knowledge of preservation of organic matter, but it is of questionable value in characterizing organic matter sources for Delta food webs. The science proposed is technically difficult but the investigators have the expertise to

accomplish the research. Concern was raised that inadequate attention was paid to analyzing suspended particulate matter entering the system, riverine sampling, and demonstrating an adequate understanding of diagenesis of biomarkers and their sensitivity to core preservation techniques. This is of particular concern since existing cores will be used, and their mode of preservation was not identified. The use of compound-specific isotope analyses appears to be a fruitful research direction. The performance measures are publications, but timelines and project schedules are not provided.

3. **Outcomes and Products.** Will the project advance the state of scientific knowledge in general and/or make an important contribution to the state of knowledge of the Bay-Delta Watershed? For restoration proposals, is the project likely to contribute to ecosystem restoration or species recoveries in a significant way? Will the project produce products useful to decision-makers and scientists?

   The project will advance understanding of carbon cycling in the Delta and of sources of organic matter in Delta sediments. It is less likely to contribute to an understanding of Delta food webs. It is not clear how decision makers would find this information useful, and there is no indication of any efforts at outreach.

4. **Cost/Benefit Comments.** Is the budget reasonable and adequate for the work proposed?

   Budget is adequate, although some concerns about overhead rates were raised (see below). Using existing cores helps keep costs down while taking advantage of existing information already obtained on those cores. That is both a strength and a potential weakness (see #2 above) of this proposal.

5. **Regional Review.** How did the regional panel(s) rank the proposal (High, Medium, Low)? Did the regional panel(s) identify significant benefits (regional priorities, linkages with other activities, local involvement) or impediments (local constraints, conflicts with other activities, lack of local involvement) to this proposal? What were they?

   One region ranked it medium; the other ranked it low. Both saw little linkage between the proposed research and restoration in the region. They saw little linkage with others working on organic matter in the Delta and with local groups. An interesting question was posed: If this project demonstrates that the Delta is a carbon sink, would that make it eligible for carbon credit programs?

6. **Administrative Review.** Were there significant concerns about the proposal with regard to the prior performance, environmental compliance and budget administrative reviews? What were they?

   No prior performance review. If additional core samples are taken, permits will be needed. Some budget concerns were raised. Funding for project management was not clearly presented. The proposal uses a federal overhead rate; a lower overhead rate needs to be established for state funds. Total funds requested (17A) were greater ($772,701) than the combined total annual costs ($746,923).

Miscellaneous comments:

None

Bay Regional Review:

Proposal Number: 247

Applicant Organization: Virginia Institute of Marine Science

Proposal Title: Organic Matter Composition of Sediments in the Sacramento-San Joaquin River Delta: Past and Present Sources of Organic Carbon and Implications for Ecosystem Restoration

Overall Ranking: **-**Low **X**Medium **-**High

Provide a brief summary explanation of the committee's ranking:

Although a sound proposal, the panel did not believe it needs immediate funding, and thought the link to restoration may be tenuous, although other regional panels may disagree.

1. Is the project feasible based on local constraints?

   XYes **-**No

   How?

   No constraints based on timing, permits, weather, or regulations.

2. Does the project pursue the restoration priorities applicable to the region as outlined in the PSP?

   XYes **-**No

   How?

   ERP Goal 2, increase productivity and rehabilitate the food web: the proposed work would investigate the source, amount, age and quality of organic matter in the estuary (the food source for filter- and deposit-feeding organisms). MR-5: determine and reduce dissolved oxygen and oxygen-depleting substances. The proposed work would seek to understand factors contributing to declines in productivity in the Delta and Bay.

3. Is the project adequately linked with other restoration activities in the region, such as ongoing implementation projects and regional planning efforts?

   XYes **-**No

   How?

   The study will support other projects aimed at understanding water and sediment quality in the Delta, and factors contributing to declines in productivity, and is linked to a current study examining the transport and transformation of selenium and carbon in the Delta. No Bay studies were mentioned by the applicants.

4. Does the project adequately involve local people and institutions?

   XYes **-**No

   How?

   Although not local groups have been contacted, the applicants state they are committed to working with such groups and local governments, and the PI is willing to be involved in an advisory capacity with CALFED and other groups.

Other Comments:

The panel wondered if this could elucidate whether Delta is a potential carbon sink and if restoration can be funded through carbon credit programs.

Delta Regional Review:

Proposal Number: 247

Proposal Title: Organic Matter Composition of Sediments in the Sacramento-San Joaquin River Delta: Past and Present Sources of Organic Carbon and Implications for Ecosystem Restoration

Overall Ranking: **X**Low **-**Medium **-**High

Provide a brief summary explanation of the committee's ranking:

This project is not relevant to the 2002 PSP's Delta priorities.

1. Is the project feasible based on local constraints?

   XYes **-**No

   How?

   Samples were collected in a previous study. Proposed evaluation is based on previous work and is complementary to it.

2. Does the project pursue the restoration priorities applicable to the region as outlined in the PSP?

   -Yes **X**No

   How?

   There is no specific restoration priority listed for this project. It proposes to generate information that will be useful toward understanding sources, reactivity and changes over time of sedimentary organic matter But the linkage of this information to various restoration priorities is not described. In terms of adaptive management it is not clear how this information will help in management decisions. The linkage of water management practices to organic delivery in the Delta using sediment analysis records as described in the proposal seems like a big jump.

3. Is the project adequately linked with other restoration activities in the region, such as ongoing implementation projects and regional planning efforts?

   -Yes **X**No

   How?

   This work will be based on previous work done in the Delta on sources and nutritional value of suspended particulate organic matter in the Delta. However, it is not clear if the project proponents have discussed their work with others working in the Delta on non organic matter projects such as invertebrate feeding projects, primary productivity projects, etc. Consequently, the applicability of this work toward achieving the CALFED objectives is unclear.

4. Does the project adequately involve local people and institutions?

   -Yes **X**No

   How?

   The connection with local people and institutions is weak beyond the samples being collected by local agencies (USGS).

Other Comments:

Laboratory techniques seem to be the focus of this project. Perhaps conceptual models demonstrating the significance of this work in appropriate scales to restoration objectives would be helpful in understanding the applicability of this work to what CALFED is trying to achieve.

External Scientific: #1

Research and Restoration External Scientific Review Form

Proposal Number: **247**

Applicant Organization: **Virginia Institute of Marine Science**

Proposal Title: **Organic Matter Composition of Sediments in the Sacramento-San Joaquin River Delta: Past and Present Sources of Organic Carbon and Implications for Ecosystem Restoration**

Conflict of Interest Statements:
I have no financial interest in this proposal.
XCorrect
-Incorrect

In the blank below please explain any connection to proposal, to applicant, co-applicant or subcontractor or to submitting institution (write "none" if no connection):

none

Review:

Please provide an overall evaluation summary rating:

<u>Excellent:</u> outstanding in all respects;
<u>Good:</u> quality but some deficiencies;
<u>Poor:</u> serious deficiencies.

Overall Evaluation Summary Rating	**Provide a brief explanation of your summary rating**
XExcellent	**I have no doubts that this group will conduct high quality research that enhances knowledge of the preservation of organic matter, but I do question how valuable this research will be for characterizing the sources of organic matter supporting food webs in the delta.**
-Good	
-Poor	

1. **<u>Goals.</u>** Are the goals, objectives and hypotheses clearly stated and internally consistent? Is the concept timely and important?

   The goals and objectives are clearly stated, and the proposed research directly addresses these goals. The proposed research is "state-of-the-art" and important for understanding carbon cycling.

2. **<u>Justification.</u>** Is the study justified relative to existing knowledge? Is a conceptual model clearly stated in the proposal and does it explain the underlying basis for the proposed work? Is the selection of research, pilot or demonstration project, or a full-scale implementation project justified?

The proposed studies of the sources of organic matter to delta sediments is well justified and will definitely result in high quality description of carbon sources and reactivity in sediments.

3. **Approach.** Is the approach well designed and appropriate for meeting the objectives of the project? Are results likely to add to the base of knowledge? Is the project likely to generate novel information, methodology or approaches? Will the information ultimately be useful to decision-makers?

   The proposed studies are well planned and appropriate. They will clearly increase knowledge of the carbon sources in delta sediments. It is likely that this project will generate novel ideas and concepts about organic matter preservation. It is difficult to assess how much impact this will have on decision makers.

4. **Feasibility.** Is the approach fully documented and technically feasible? What is the likelihood of success? Is the scale of the project consistent with the objectives?

   The proposed research is technically difficult, but I believe the PIs will accomplish the main objective of the study. The scale of the proposed research is appropriate.

5. **Project-Specific Performance Measures.** Does the project include appropriate performance measures to measure success relative to the project's goals and objectives? Is there enough detail as to how the performance measures will be quantified? For restoration projects, are monitoring plans explicit and detailed enough to determine if performance measures will be adequately assessed?

   I'm confident the project has appropriate performance measures.

6. **Products.** Are products of value likely from the project? Specifically for restoration projects, are products of value also likely from the monitoring component? Are interpretative outcomes likely from the project?

   This project should result in several peer-reviewed journal articles. The project should result in novel insights about organic matter preservation in sediments.

7. **Capabilities.** What is the track record of applicants in terms of past projects? Is the project team qualified to efficiently and effectively implement the proposed project? Do they have available the infrastructure and other aspects of support necessary to accomplish the project?

   The applicants have very good track records and are clearly qualified to conduct the proposed research. They have experience with all proposed measurements.

8. **Cost/Benefit Comments.** Is the budget reasonable and adequate for the work proposed?

   It appears that most of the samples needed for the study are already in hand. This should reduce costs. The budget reflects the expensive nature of the work, but it might be possible to do some trimming without a major impact on the success of the project.

Miscellaneous comments:

Strengths: Delta ecosystems are very complex, with numerous external sources of organic matter and numerous internal primary producers. Determining the origins and reactivity of organic matter in such ecosystems is a major challenge that requires multiple approaches. The proposed research is multifaceted and thorough, and it is well designed to accomplish the stated objectives. Bulk chemical and isotopic measurements will provide a broad description of the sources and

reactivity of organic matter in the delta. A wide variety of specific biomarker compounds that have great potential for identifying organic matter sources will be analyzed to unravel the origins of organic matter. In addition, isotopic measurements on specific biomarkers will add yet another level of detail that will reveal the pathway of C fixation (C3 vs C4) and the age (14C content) of specific compounds. These later measurements are difficult to accomplish, but the PIs have experience with all of these analyses and the project is likely to be successful. The reactivity of organic matter will primarily be determined based on the abundance and composition of amino acids and the 14C content. Both of these are good indicators of the quality of organic matter to consumers. Based on combined radiotracer and biomarker analyses of sediment cores, the PIs will assess the recent history of organic matter sources to the delta. This aspect of the proposed research is also well planned and likely to be successful.

Weaknesses: The PIs assume that characterizing the sources of organic matter preserved in sediments will provide insights about the sources of organic matter that support food webs in the delta. This is a major assumption that was not addressed in the proposal. The organic matter supporting food webs is not preserved in sediments, so I wonder if this assumption is valid. I would assume that the organic matter supporting food webs in the delta is produced in the delta. Most organic matter entering food webs is rapidly consumed after production. This labile organic matter has a fairly short half-life and is not in a mobile form long enough for transport out of the system or import from outside the system.

External Scientific: #2

Research and Restoration External Scientific Review Form

Proposal Number: **247**

Applicant Organization: **Virginia Institute of Marine Science**

Proposal Title: **Organic Matter Composition of Sediments in the Sacramento-San Joaquin River Delta: Past and Present Sources of Organic Carbon and Implications for Ecosystem Restoration**

Conflict of Interest Statements:
I have no financial interest in this proposal.
XCorrect
-Incorrect

In the blank below please explain any connection to proposal, to applicant, co-applicant or subcontractor or to submitting institution (write "none" if no connection):

none

Review:

Please provide an overall evaluation summary rating:

<u>Excellent:</u> outstanding in all respects;
<u>Good:</u> quality but some deficiencies;
<u>Poor:</u> serious deficiencies.

Overall Evaluation Summary Rating	**Provide a brief explanation of your summary rating**
-Excellent	**This is a well-designed study to attempt to identify organic biomarkers in sediment cores. If the Bay were a large lake with limited tributary input, this would be an ideal study. My main concern is the dynamic nature of the riverine input and the lack of attention to quantifying these sources. The sediments integrate numerous process and without delineating the magnitude and composition of the sources, interpretation becomes tricky. This is especially true for the more labile biomarkers. This project would also benefit from collaboration with individuals studying contaminants with a high affinity for organic matter.**
XGood	
-Poor	

1. **<u>Goals.</u>** Are the goals, objectives and hypotheses clearly stated and internally consistent? Is the concept timely and important?

   This is a well-conceived research proposal with specific goals. It attempts to build on previous work in the Bay-Delta region and provides some new angles to work on identification of carbon sources to the ecosystem. The general concept is timely and it is important for understanding a number of processes in the basin.

2. **Justification.** Is the study justified relative to existing knowledge? Is a conceptual model clearly stated in the proposal and does it explain the underlying basis for the proposed work? Is the selection of research, pilot or demonstration project, or a full-scale implementation project justified?

   As a research project, this proposal represents a gradual process that is aimed at understanding carbon dynamics in this sensitive ecosystem. It is a logical progression of research and attempt to bring additional investigators with new areas of expertise to better understand carbon dynamics. A conceptual model is presented for understanding isotopic distribution, but there is little detail of the diagenetic modeling that is so critical to interpretation of the data.

3. **Approach.** Is the approach well designed and appropriate for meeting the objectives of the project? Are results likely to add to the base of knowledge? Is the project likely to generate novel information, methodology or approaches? Will the information ultimately be useful to decision-makers?

   The approach of this study is fairly standard and not extremely innovative. It involves collecting sediment cores from various regions of the Bay area and determining the content of specific biomarker compound. Next, the investigators hope to attribute the content and concentration of biomarkers to sediment age. This is a common approach from a paleo-type study, but one that may not be best suited for the dynamic nature of the ecosystem and the relative lability of the chosen biomarkers.

   It would appear that the PIs need to do a good deal of work identifying the nature of suspended particulate matter entering the system. I feel this is extremely important for a number of reasons. First, several proposals have indicated that particle loading to the system is episodic. This is a critical observation, not only for carbon, but for corresponding contaminants that may be carried downstream. It would be quite important from a management viewpoint to have an idea about what types of organic carbon are being transported and at what times during the year. Next, the PIs really need to demonstrate that they have a true handle on diagenesis of their biomarkers in this dynamic system. The pigments, specifically, are subject to intense degradation that are both pigment-specific and dependent upon initial conditions of preservation. Sources may come from phytoplankton, periphyton and complex algal-bacterial mats common to the Bay. Each represents significantly different pathways of productivity and carbon sources. Finally, there are numerous processes that occur within the river basin that may affect carbon source. For instance, the Yolo Bypass is a huge expanse that is temporarily flooded during high water periods. During non-flood periods, it is active farmland. How do these sources affect biomarker inputs? It is imperative that these investigators conduct riverine sampling to identify the variability of carbon source and flux. I can understand that field work from the Gulf and East coasts may be difficult, but partnering with a Bay Area university may be a plus.

   Is the Se study the best partner for contaminant studies? It appears that while this may save some coring time, but there are many other contaminants with specific organic matter partitioning properties that may be a better match.

   Do the PIs plan to include a measure of recent mixing, such as Be-7 to assess the affects of biomarker preservation and accumulation based on surface mixing?

4. **Feasibility.** Is the approach fully documented and technically feasible? What is the likelihood of success? Is the scale of the project consistent with the objectives?

As designed, this is a feasible study to answer some general questions about carbon source in the accumulating sediment. The scale is consistent with the objectives, however limited.

5. **Project-Specific Performance Measures.** Does the project include appropriate performance measures to measure success relative to the project's goals and objectives? Is there enough detail as to how the performance measures will be quantified? For restoration projects, are monitoring plans explicit and detailed enough to determine if performance measures will be adequately assessed?

   Relative to the projects goals, it would be better to see some details of performance measures other than a promise for several peer-reviewed publications. What is the QA associated with the project? Which goals are Year 1, 2, etc.? With what degree of certainty do the PIs expect to be able to use their results and predictions?

6. **Products.** Are products of value likely from the project? Specifically for restoration projects, are products of value also likely from the monitoring component? Are interpretative outcomes likely from the project?

   There seems to be a disconnect between the objectives and the delivery of results that aid in planning restoration techniques for the basin. This might be better addressed by actively sampling and understanding various subwatersheds in the basin. The Bay tends to integrate numerous processes in the watershed.

7. **Capabilities.** What is the track record of applicants in terms of past projects? Is the project team qualified to efficiently and effectively implement the proposed project? Do they have available the infrastructure and other aspects of support necessary to accomplish the project?

   The PIs are experts in the field of carbon dynamics and are well-qualified to pursue a project as outlined. They have all of the infrastructure necessary to carry out the project as designed.

8. **Cost/Benefit Comments.** Is the budget reasonable and adequate for the work proposed?

   This is a fairly typical budget for the number of academic researchers involved. They may want to cut back on some of the detailed Bay work and support a local entity to collect riverine samples.

Miscellaneous comments:

External Scientific: #3

Research and Restoration External Scientific Review Form

Proposal Number: **247**

Applicant Organization: **Virginia Institute of Marine Science**

Proposal Title: **Organic Matter Composition of Sediments in the Sacramento-San Joaquin River Delta: Past and Present Sources of Organic Carbon and Implications for Ecosystem Restoration**

Conflict of Interest Statements:
I have no financial interest in this proposal.
XCorrect
-Incorrect

In the blank below please explain any connection to proposal, to applicant, co-applicant or subcontractor or to submitting institution (write "none" if no connection):

none

Review:

Please provide an overall evaluation summary rating:

<u>Excellent:</u> outstanding in all respects;
<u>Good:</u> quality but some deficiencies;
<u>Poor:</u> serious deficiencies.

Overall Evaluation Summary Rating	**Provide a brief explanation of your summary rating**
-Excellent	**This project will characterize sources, ages, nutritional value and diagenetic state of organic matter entering the Delta. It builds on previous research designed to assess sources and nutritional value of particulate organic matter and relates to existing and proposed studies on carbon and Se in the Delta. This proposal represents solid science, but there is a poor linkage of findings to relevant policy issues. How could these findings be used to guide restoration efforts?**
XGood	
-Poor	

1. **<u>Goals.</u>** Are the goals, objectives and hypotheses clearly stated and internally consistent? Is the concept timely and important?

   The goal of the project is to assess the impact of human activities on organic matter delivery to the Delta. Although this is clearly of scientific interest, it does not seem as threatening to the health of the ecosystem as other human impacts. The team is attempting to establish a set of indicators that will allow them and future researchers the ability to assess organic matter sources. This presumably would be useful to determine if restoration actions are having an impact on organic matter delivery to the Delta.

2. **Justification.** Is the study justified relative to existing knowledge? Is a conceptual model clearly stated in the proposal and does it explain the underlying basis for the proposed work? Is the selection of research, pilot or demonstration project, or a full-scale implementation project justified?

   The hypothesis is that the decline in productivity of the Delta ecosystem is a consequence of the progressive loss of wetlands and changes in the freshwater delivery of carbon. A conceptual model is presented in Figure 1, but there is no attempt to indicate the relative importance of the different sources or sinks of C. I don't find the results from previous research particularly compelling. The stable isotope biplots shown suggest seston is coming from a mixture of sources, not that sources are unidentified.

3. **Approach.** Is the approach well designed and appropriate for meeting the objectives of the project? Are results likely to add to the base of knowledge? Is the project likely to generate novel information, methodology or approaches? Will the information ultimately be useful to decision-makers?

   The science is solid in this proposal. They propose to use additional biomarkers to better characterize organic matter in different environments. The linkage to the Se study in the paleo work seems valuable. They propose to use existing sediment and core samples for further analyses, which is a good idea. The amino acid analyses do not seem to make a very significant contribution to the study as a whole. It is not clear how this information would be used to "guide restoration strategies." More thought needs to be given to how a decision-maker would use this information. I can see how it might be used to evaluate restoration activities, if reliable indicators of organic matter sources are found.

4. **Feasibility.** Is the approach fully documented and technically feasible? What is the likelihood of success? Is the scale of the project consistent with the objectives?

   It is feasible, likely to succeed and of the appropriate scale.

5. **Project-Specific Performance Measures.** Does the project include appropriate performance measures to measure success relative to the project's goals and objectives? Is there enough detail as to how the performance measures will be quantified? For restoration projects, are monitoring plans explicit and detailed enough to determine if performance measures will be adequately assessed?

   The performance measures noted are peer-reviewed papers, which is appropriate for a science project.

6. **Products.** Are products of value likely from the project? Specifically for restoration projects, are products of value also likely from the monitoring component? Are interpretative outcomes likely from the project?

   The goal is to provide a set of indicators that will allow individuals to determine the source of organic matter in the Delta. This would be a useful product.

7. **Capabilities.** What is the track record of applicants in terms of past projects? Is the project team qualified to efficiently and effectively implement the proposed project? Do they have available the infrastructure and other aspects of support necessary to accomplish the project?

   The scientists are productive and have the appropriate technical abilities.

8. **Cost/Benefit Comments.** Is the budget reasonable and adequate for the work proposed?

   Proposal seems reasonable. I am particularly impressed that they will use existing sediment cores for some of the work, which is a clear savings as well as making scientific sense.

Miscellaneous comments:

External Scientific: #4

Research and Restoration External Scientific Review Form

Proposal Number: **247**

Applicant Organization: **Virginia Institute of Marine Science**

Proposal Title: **Organic Matter Composition of Sediments in the Sacramento-San Joaquin River Delta: Past and Present Sources of Organic Carbon and Implications for Ecosystem Restoration**

Conflict of Interest Statements:
I have no financial interest in this proposal.
XCorrect
-Incorrect

In the blank below please explain any connection to proposal, to applicant, co-applicant or subcontractor or to submitting institution (write "none" if no connection):

none

Review:

Please provide an overall evaluation summary rating:

Excellent: outstanding in all respects;
Good: quality but some deficiencies;
Poor: serious deficiencies.

Overall Evaluation Summary Rating	**Provide a brief explanation of your summary rating**
XExcellent	**Scientifically, this is an excellent proposal and will provide some new interpretive tools to CALFED restoration planning. It absolutely needs to acknowledge the obligation of the applications to participate extensively in communication, sharing and outreach within and outside of the CALFED/Bay-Delta community.**
-Good	
-Poor	

1. **Goals.** Are the goals, objectives and hypotheses clearly stated and internally consistent? Is the concept timely and important?

   The goal of the project is to use isotopic and molecular biomarkers to characterize the sedimentary organic matter that has cycled through the Delta in historic and modern times, and predict the effects of proposed restoration strategies on organic carbon availability. The objectives involve biomarker analysis of the aquatic and terrestrial sources of sedimentary organic matter deposited in Delta subhabitats, the reactivity of the sedimentary organic matter within the subhabitats, separate sources and ages of the sedimentary organic matter, and determine anthropogenic influences on organic matter composition. Although not necessarily organized by explicit hypotheses, the objectives are organized about four research questions.

2. **Justification.** Is the study justified relative to existing knowledge? Is a conceptual model clearly stated in the proposal and does it explain the underlying basis for the proposed work? Is the selection of research, pilot or demonstration project, or a full-scale implementation project justified?

   It is argued that this approach will facilitate interpretation of the relative roles of freshwater flow alteration, increased expansion of non-indigenous species, the loss of wetlands and increased contamination in the Delta.

3. **Approach.** Is the approach well designed and appropriate for meeting the objectives of the project? Are results likely to add to the base of knowledge? Is the project likely to generate novel information, methodology or approaches? Will the information ultimately be useful to decision-makers?

   The approach is well described, organized and the design and methodologies provided in excellent detail. The sampling design takes into account the potential variation in Delta subhabitat sources and sinks of organic matter and seasonal variation to capture changes in hydrology and productivity. Unlike many CALFED proposals, all important methodologies are linked to critical literature sources.

4. **Feasibility.** Is the approach fully documented and technically feasible? What is the likelihood of success? Is the scale of the project consistent with the objectives?

   This project has a very high degree of feasibility, as indicated by the detailed approach and methods and the investigators experience.

5. **Project-Specific Performance Measures.** Does the project include appropriate performance measures to measure success relative to the project's goals and objectives? Is there enough detail as to how the performance measures will be quantified? For restoration projects, are monitoring plans explicit and detailed enough to determine if performance measures will be adequately assessed?

   Performance measures are expressed as completed products but without schedules and timelines for projects research tasks and emerging results. Whether intended or not, their comment that they are willing to meet with other CALFED scientists, participate in CALFED workshops or have involvement in other activities deemed important to meeting CALFED goals implies a somewhat aloof view of this projects integration into the CALFED science and restoration community.

6. **Products.** Are products of value likely from the project? Specifically for restoration projects, are products of value also likely from the monitoring component? Are interpretative outcomes likely from the project?

   Products are focused on academic theses and dissertations (2-3) and 4-5 publications submitted to peer-reviewed scientific journals. Although they stipulate that the study results will be available to research and monitoring programs in the Delta, they do not describe how that will take place. There is no indication of public outreach and other information dissemination outside the research community.

7. **Capabilities.** What is the track record of applicants in terms of past projects? Is the project team qualified to efficiently and effectively implement the proposed project? Do they have available the infrastructure and other aspects of support necessary to accomplish the project?

The applicants and institutions are highly qualified and the lead investigator (Canuel) has recent background in related CALFED investigations.

8. **Cost/Benefit Comments.** Is the budget reasonable and adequate for the work proposed?

   The estimated project cost ($746,923) is not out of scale to the tasks proposed.

Miscellaneous comments:

Prior Performance/Next Phase Funding:

New Proposal Number: 247

New Proposal Title: Organic Matter Composition of Sediments in the Sacramento-San Joaquin River Delta: Past and Present Sources of Organic Carbon and Implications for Ecosystem Restoration

1. Prior CALFED project numbers, titles, and programs: (*list only projects for which you are the contract manager*)

   NOTE the Prior/Ongoing CALFED Project Title and Number do not match on the faxed list and the beginning and end of the title is missing -- you have listed ....matter in the habitat and its relationship to the food chain....as 97-B06?? Following are the three agreements with correct Title and Number and Project Manager that I have administered with USGS:

   CALFED #97-B02, USBR #98-AA-20-16230 - U.S. Geological Survey - Sedimentation Movement, Availability and Monitoring in the Delta - David Schoellhamer

   CALFED #97-B06, USBR #98-AA-20-16240 - U.S. Geological Survey - Assessment of the Sacramento-San Joaquin River Delta as Habitat for Production of the Food Resources that Support Fish Recruitment - William Sobczak

   CALFED #98-B07, USBR #98-AA-20-16950 - U.S. Geological Survey - Assessment of the Impacts of Selenium on Restoration of the San Francisco Bay-Delta Ecosystem - Sam Luoma

2. Prior CVPIA project numbers, titles, and programs: (*list only projects for which you are the contract manager*)

   N/A

3. Have negotiations about contracts or contact amendments with this applicant proceeded smoothly, without persistent difficulties related to standard contract terms and conditions?

   -Yes -No **X**N/A

   If no, please explain any difficulties:

4. Are the status, progress, and accomplishments of the applicant's current CALFED or CVPIA project(s) accurately stated?

   -Yes -No **X**N/A

   If no, please explain any inaccuracies:

5. Is the applicant's progress towards these project(s)' milestones and outcomes to date satisfactory?

   -Yes -No **X**N/A

   If no, please explain deficiencies:

6. Is the applicant's reporting, records keeping, and financial management of these projects satisfactory?

   -Yes -No **X**N/A

   If no, please explain deficiencies:

7. Will the project(s) be ready for next phase funding in 2002, based on its current progress and expenditure rates?

   -Yes -No **X**N/A

   If no, please explain:

Other Comments:

No personal knowledge of performance of Virginia Institute of Marine Science who is applicant for this proposal

Environmental Compliance:

Proposal Number: 247

Applicant Organization: Virginia Institute of Marine Science

Proposal Title: Organic Matter Composition of Sediments in the Sacramento-San Joaquin River Delta: Past and Present Sources of Organic Carbon and Implications for Ecosystem Restoration

1. Are the legal or regulatory issues that affect the proposal identified adequately in the proposal?

   -Yes **X**No

   If no, please explain:

   If additional sediment cores are needed, a 1600 permit from DFG and consulatation with the Corps may be necessary.

2. Does the project's timeline and budget reflect adequate planning to address legal and regulatory issues that affect the proposal?

   -Yes **X**No

   If no, please explain:

   No money budgeted for permits if they are needed.

3. Do the legal and regulatory issues that affect the proposal significantly impair the project's feasibility?

   -Yes **X**No

   If yes, please explain:

   If project proponents obtain any necessary permits for additional core samples, this project is feasible.

Other Comments:

Budget:

Proposal Number: 247

Applicant Organization: Virginia Institute of Marine Science

Proposal Title: Organic Matter Composition of Sediments in the Sacramento-San Joaquin River Delta: Past and Present Sources of Organic Carbon and Implications for Ecosystem Restoration

1. Does the proposal include a detailed budget for each year of requested support?

   XYes **-**No

   If no, please explain:

2. Does the proposal include a detailed budget for each task identified?

   XYes **-**No

   If no, please explain:

3. Does the proposal clearly state the type of expenses encompassed in indirect rates or overhead costs?

   XYes **-**No

   If no, please explain:

4. Are appropriate project management costs clearly identified?

   -Yes **X**No

   If no, please explain:

   Project Manager not considered in year 1, year 2 only "Publication Services", and year 3 only "Services"?

5. Do the total funds requested (Form I, Question 17A) equal the combined total annual costs in the budget summary?

   -Yes **X**No

   If no, please explain (for example, are costs to be reimbursed by cost share funds included in the budget summary).

   Question 17a. = $772,701, and Budget Summary = $746,923.

6. Does the budget justification adequately explain major expenses?

   XYes **-**No

   If no, please explain:

7. Are there other budget issues that warrant consideration?

   XYes **-**No

   If yes, please explain:

   Applicant uses a Federal (Navy) overhead rate, need to establish a lower overhead rate when proposing/contracting for State funds.

Other Comments: